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NEW CONSIDERATIONS IN AN OLD GENUS: *DATURA*

BY

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THE genus *Datura* has received considerable attention over the years from ethnobotanists and pharmacologists whose interest in this group of plants stems from the presence of the toxic alkaloids contained in most, if not all, of the species. The herbaceous members of the genus have assumed an outstanding position in the annals of experimental botany at the hands of geneticists and cytologists. In spite of the amount of space devoted to this genus in the literature, we are still in need of an adequate taxonomic treatment. It is hoped that this paper will help to clarify some of the nomenclatorial intricacies surrounding two species well known to botanists and workers in allied fields. Furthermore, descriptions of three new species which were discovered during the preparation of a monograph of the genus are included.

There has been much controversy concerning the correct name for the species which has been known as *Datura meteloides* DC. ex Dunal, but which preferably should be called *D. inoxia* Miller. In order to understand how this confusion came about it is necessary to present a brief résumé of the nomenclatorial history of these concepts.

I. THE TYPIFICATION OF *Datura meteloides* DC. ex Dunal

The name *Datura meteloides* was first proposed by Dunal in a manuscript which he sent to Alphonse de Candolle, who in turn published the epithet in his *Prodromus* (1852). Hence, the correct citation should be *Datura meteloides* DC. ex Dunal. Alphonse de Candolle based his concept of *D. meteloides* on both the drawing and the description by Sessé and Mociño as we may see from the following note in the *Prodromus*: "In calidis Novae Hispaniae regionibus. D. Metel Moc. et Sess. pl. Mexic. ined. ic. et mss. t. 919, collect. transl. Candoll." The original Sessé and Mociño illustrations were loaned to August Pyramus de Candolle and were recalled on short notice. As a result, de Candolle, who recognized the value of these drawings, enlisted the help of the townspeople of Geneva to make copies of them before sending them back. One of these copies, *Icones* no. 919, has served as the type of *D. meteloides* and is now preserved in the Candollean Herbarium (Ewan, 1944).

In 1855, a new *Datura* was brought into cultivation by the French horticulturist M. Louis Vilmorin from seeds sent him by Asa Gray who had obtained them from a collection made by Charles Wright (no. 526) in western Texas in 1849. This plant was cultivated and distributed under the name of *Datura meteloides* (Ewan, 1944). M. Ortgies, an employee of the Vilmorin Co. of France, noticed the discrepancy between de Candolle's description of *D. meteloides* and the plant cultivated under the same name and brought it to the attention of the German botanist, Dr. Eduard von Regel. As a result, a new species, *D. Wrightii*, was published by Regel (1859).

Gray (1878) considered the southwestern perennial species of the United States to represent *Datura mete-*

loides and relegated *D. Wrightii* to synonymy handling the obvious lack of agreement between the two descriptions with the following comment: “. . . Dunal in DC. Prodr. l.c. 544 (the descr. and drawing of Mocino and Sesse wrong as to 10-dentate corolla).” This erroneous interpretation was adopted by Safford (1921) who apparently followed Gray.

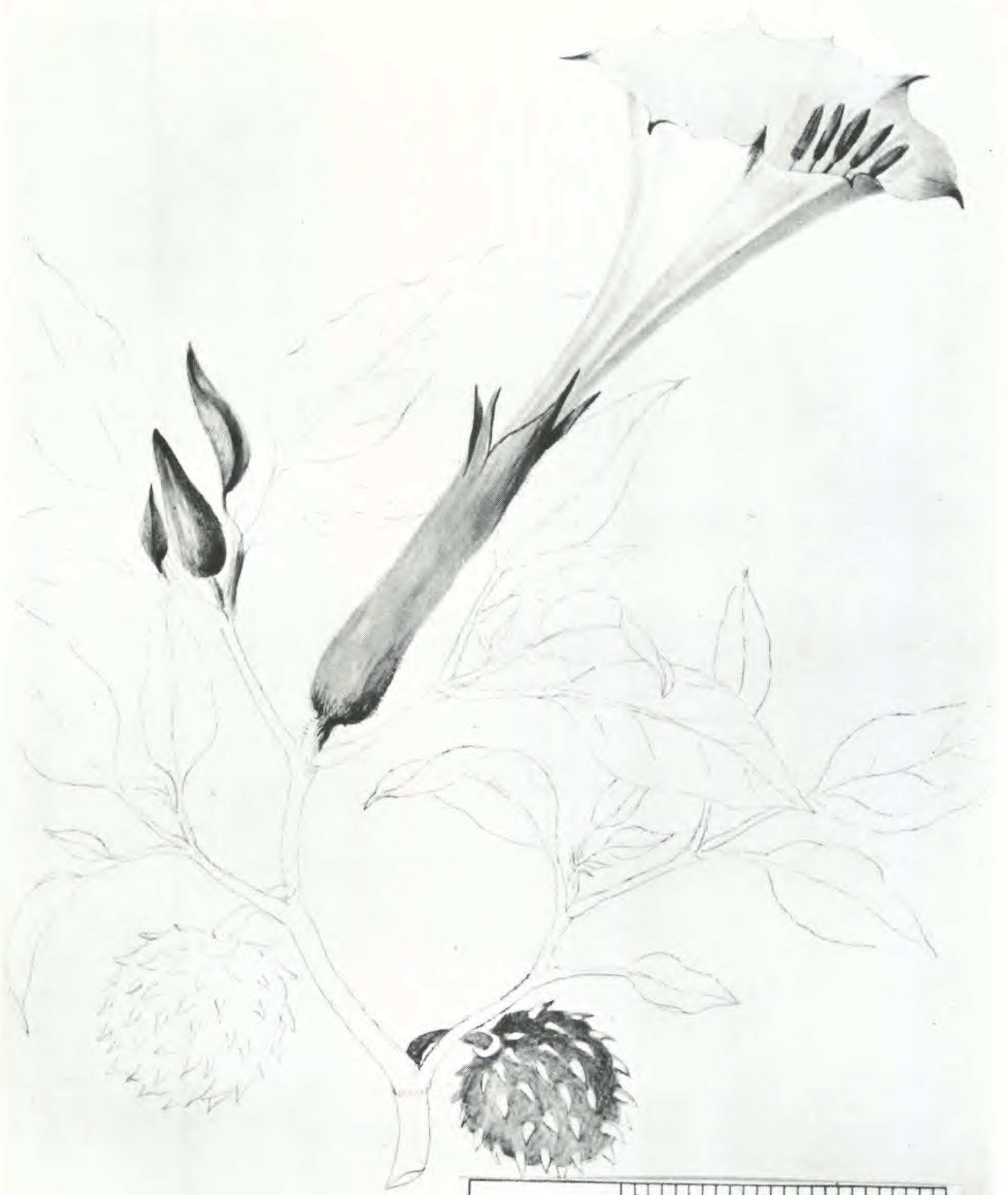
It is obvious from Dunal's monograph (1852) that he had no knowledge of *Datura inoxia* Mill. (Miller, 1786) which, since it is apparently identical with *D. meteloides*, enjoys priority. Miss Helen Timmerman (1927), although recognizing the problem existing in the literature, failed to reach a satisfactory conclusion regarding *D. meteloides* and *D. inoxia* probably due to insufficient material at hand.

Recently, Ewan (1944) became cognizant of the problem concerning the discrepancy between the description of *Datura meteloides* sensu DC. and our perennial southwestern species commonly known by that name. In attempting to unravel this confusion he presented an excellent account of the historical backgrounds of both *D. meteloides* and *D. Wrightii*. His conclusion that de Candolle's *D. meteloides* “cannot be shown to be a misapplied binomial because no other species of *Datura* has been found in central Mexico which agrees with the original description nor the drawing upon which it is based” is hardly acceptable due to the ample herbarium material of *D. inoxia* at hand. Furthermore, his recommendation that the name to be applied to our perennial species should be *D. Wrightii*, provided the identity of *D. meteloides* DC. ex Dunal cannot be ascertained, requires more thought. His proposal that the collection *C. Wright no. 526* (US 60042) be designated as lectotype of *D. Wrightii* with Turkey Creek, Uvalde-Kinney Co. line, Texas as type locality appears to be a wise choice, but,

EXPLANATION OF THE ILLUSTRATION

PLATE L. The illustration of *DATURA METELOIDES*
DC. ex Dunal in the Candollean Herbarium which
formerly served as type.

PLATE L



30800	¹² Datura meteloides
S. & M.	Prod. 13.11.544.
N. 919,	cm 1 2 3 4 5
ex. #	

EXPLANATION OF THE ILLUSTRATION

PLATE LI. Isotype of *DATURA METELOIDES* preserved
in the Chicago Natural History Museum.

Photograph by A. S. BARCLAY AND R. T. MOORE



847215

HERBARIUM
FIELD MUSEUM

HERBARIUM HORTI BOTANICI MATRITENSIS
Plantae Novae Hispaniae.

a Sessé, Mociño, Castillo et Maldonado lectae
(1787-1795-1801).

Datura innoxia Mill.

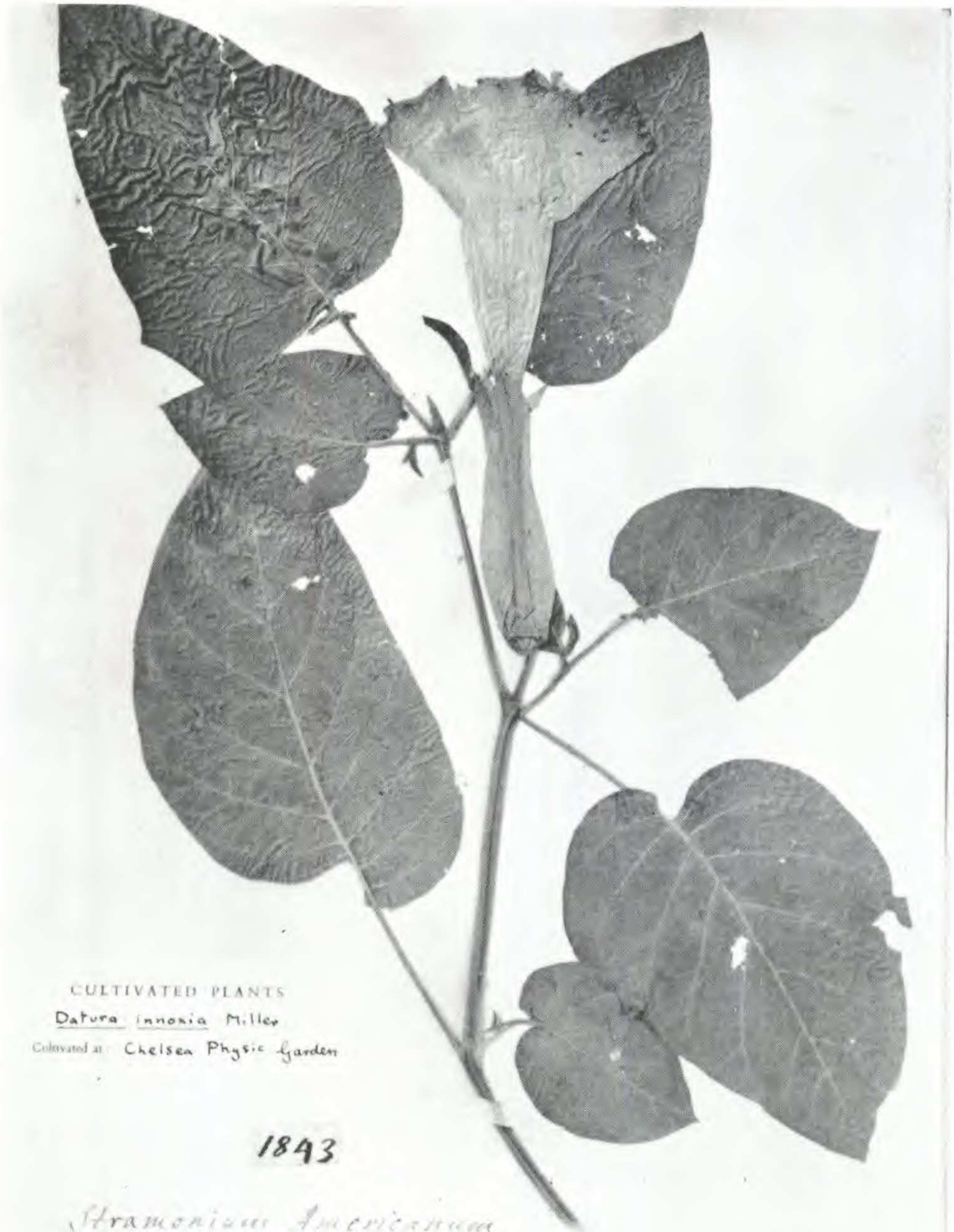
"Datura Metel N."

no. 1572

EXPLANATION OF THE ILLUSTRATION

PLATE LII. Neotype of *Datura innoxia* *Miller* preserved in the British Museum.

Photograph sent by J. E. DANDY



CULTIVATED PLANTS
Datura innoxia Miller
 Cultivated at: Chelsea Physic Garden

1843

Stramonium Americanum
 maximum, flore albo,
 fructu rotundo spinoso
 Sloan,
 1758.

Specimen listed in Phil. Trans. S. 1.
 99 no. 1843 (1760) as one of the
 'Fifty Plants from Chelsea Garden
 presented to the Royal Society by
 the worshipful Company of Apothecaries
 for the Year 1757, pursuant to
 the Direction of Sir Hans Sloane'

W.T.S.
 1958

according to the present provisions of the International Code of Botanical Nomenclature (Art. 7, Note 3, 1956), *C. Wright no. 526* should be considered a neotype rather than a lectotype as suggested also by Fosberg in a personal communication to me.

Fortunately, I have seen a specimen from the Chicago Natural History Museum which was collected by Sessé and Mociño and labeled by them as “*Datura Metel N.*” Excepting for the fruit, this specimen is identical with the illustration of *Datura meteloides* DC. (see Plates). Because of this outstanding similarity and since there is no other specimen which could fit the needs, I believe that this must represent the type collection. Inasmuch as the Chicago specimen consists of flowering material only, it seems probable that the fruits in the illustration represent an incorrect addition by an unknown artist. However, I have not yet seen the specimen in the Madrid Herbarium (MA). The Sessé and Mociño specimen mentioned above is a duplicate of the original collection. Therefore, the material in the Madrid Herbarium should serve as type specimen, and the Chicago material, *Sessé, Mociño, Castillo et Maldonado, No. 1572 ! (F no. 847215)* as an isotype. *Datura meteloides*, as typified above, is identical with the earlier *D. inoxia* of which it is therefore, a synonym. It is, furthermore, distinct from *D. Wrightii*.

II. THE TYPIFICATION OF *Datura inoxia* Miller

Datura inoxia was described by Philip Miller (1768) from plants grown from seed which he had received from “La Vera Cruz.” No type specimen was designated at that time, but there are specimens in the British Museum which were cultivated at the Chelsea Physic Garden during Miller’s curatorship (1722–1770). In the absence of a type specimen, one of these may serve.

The Chelsea Physic Garden, according to Dandy (1958), "was conveyed in 1722 to the Society of Apothecaries by Sloane (who had purchased the manor of Chelsea in 1712) on certain conditions, one of which was the 'rendering yearly to the President, Council and Fellows of the Royal Society of London, fifty specimens of distinct plants, well dried and preserved, which grew in their garden the same year, with their names or reputed names; and those presented in each year to be specifically different from every former year until the number of two thousand shall have been delivered'." This stipulation resulted in the accumulation of an herbarium of over 3000 specimens taken from the Sloane estate. The lists of plants so prepared were printed annually in the Philosophical Transactions (of the Royal Society) from 1723 to 1774. In 1781, the specimens were transferred to the British Museum and are now incorporated in the general herbarium.

Miller described the Chelsea plants in successive editions of his Gardener's Dictionary and as Stearn communicates, "when there is no specimen extant from Miller's own herbarium. . . . the application of a Miller name can often be determined or checked by a contemporary specimen from the Chelsea Garden, even though such a specimen was not dried and labelled by Miller himself."

There are, in my possession, excellent photographs of two authentic specimens of *Datura innoxia* cultivated at the Chelsea Garden and kindly sent by J. E. Dandy of the British Museum. Having examined these, I hereby designate as neotype the specimen listed in the Philosophical Transactions (of the Royal Society) 51 (1760) 99, no. 1843.

Since *Datura innoxia* and *D. meteloides* are identical, the former binomial which has priority must be taken up for this concept.

III. DESCRIPTIONS OF NEW SPECIES

***Datura kymatocarpa* Barclay sp. nov.**

Caulibus dichotomis, usque ad 40 cm. altis; foliis in ambitu ovatis, apice acutis, basi inaequalibus, margine irregulariter lobatis vel sinuato-dentatis, usque ad 11 cm. longis, dimidio seu duabus-tertiis partibus latis, utrinque strigosis; floribus erectis, axillaribus; pedicellis per anthesin 0.7–1.8 cm. longis, post anthesin elongatis reflexisque; calyce cylindrico, 2.8–4.6 cm. longo, apice 5-dentato, dentibus triangularibus; corolla albida, infundibuliformi, plicata, 6–7.5 cm. longa, orificio 5-dentato, dentibus acuminatis, 3–4 mm. longis; capsula globosa, irregulariter dehiscenti, setis semicapillaceis satis dense oblecta, 2.4 cm. longa; seminibus reniformibus, testa verrucosa.

Caulescent, dichotomously branching annual herbs, reaching 40 cm. or more in height; young branches usually villous, becoming glabrescent with age; leaves alternate, ovate in outline with an acute apex and an unequal base extended into a villous up to 8 cm. long petiole; margin irregularly lobate or sinuate-dentate; leaf blades up to 11 cm. long and usually one-half to two-thirds as broad, variously strigose on both surfaces except along the mid-vein where it is villous in the same manner as the petiole; pedicellate flowers erect, borne in the axils of the branches; pedicels during anthesis 0.7–1.8 cm. long, later becoming somewhat elongated and reflexed; calyx tube cylindrical, 2.8–4.6 cm. long and sparsely pubescent with a 5-dentate apex, teeth triangular in shape, 3–5 mm. long and 3–5 mm. broad at the base; corolla white, funnel-shaped, plicate, terminating in a 5-dentate orifice, 6–7.5 cm. long; the five corolla teeth acuminate, 3–4 mm. long and 3 mm. wide at the base, each of them supported by three conspicuous nerves, the median one

extending to the tip; the margin between each tooth bisinuate and forming an obtuse lobule giving the corolla the appearance of being 10-angled; the five stamens free, epipetalous, attached to the corolla tube at approximately the same level, about 2.5–3 cm. from the base; filaments glabrous, 2–2.3 cm. long; style equalling or slightly exceeding the anthers, 4.6–5.7 cm. long; young ovary covered with spine-like hairs; calyx circumscissile, shed with the corolla, the persistent base expanding into a membranous disk-like structure subtending the capsule, 1.5–2 cm. in diameter on mature fruit; capsule globose, pubescent, pendent on 1.5–2 cm. long pedicels; irregularly dehiscent, covered with semicapillaceous pubescent bristles, up to 2.4 cm. long; seeds reniform, about 5 mm. long and 3.5 mm. wide, seed coat verrucose.

MEXICO: State of Mexico, Dist. of Tamascaltepec, Bejucos, "llano," Aug. 15, 1935, *G. B. Hinton et al 8173* (TYPE in US 1841574).—State of Guerrero, Dist. of Coyuca, Pungarabato, "roadside," July 9, 1935, *G. B. Hinton et al 8030* (F, MO, US): Rio Balsas, Aug. 26, 1910, *C. R. Orcutt 4384* (F).—State of Michoacan, Municipality of Apatzingan, "open sun-baked pasture one-half mile S. of Apatzingan, thick adobe soil, alt. 1200 ft.," July 31, 1940, *W. C. Leavenworth 409* (F, GH, MO, NY); Municipality of Apatzingan, "common between thorn forest and road, between Apatzingan and La Majada, alt. 1200 ft.," Aug. 16, 1941, *W. C. Leavenworth & H. Hoogstraal 1615* (F, GH, MO, NY).

This species is known only from the Rio Balsas valley in Mexico. According to Leopold (1950), this valley is a tropical inland basin, cut off from the sea by highlands on all sides. In this basin, one encounters a nearly insular type of endemism, and an appreciable number of new species have been described from the collections of Hinton and Leavenworth from this general vicinity. This new *Datura* was collected by Leavenworth in the vicinity of Apatzingan at an altitude of 1200 feet and in an area designated by him as open, arid, scrub forest, which

covers the greater part of the plains of the valley-floor (Leavenworth, 1946).

Datura kymatocarpa may be readily distinguished from all other members of the genus by the semi-capillaceous bristles on its fruit and by its very characteristic seeds (see Plates). The specific epithet is derived from the Greek referring to the wavy hairs on the fruit.

***Datura reburra* Barclay sp. nov.**

Pars quae adest usque ad 30 cm. alta, caulibus dichotomis, glabris; foliis in ambitu ovato-lanceolatis, apice acutis, basi inaequalibus, margine irregulariter lobatodentatis, usque ad 8 cm. longis, dimidio vel duabus-tertiis partibus latis, lamina utrinque glaberrima; floribus pedicellatis, axillaribus, primum plusminusve erectis, deinde post anthesin valde nutantibus; calyce prismatico, carinato-angulato, ca. 6 cm. longo, apice 5-dentato, dentibus satis prominentibus, ovato-lanceolatis, 1.7–2 cm. longis; corolla infundibuliformi, plicata, usque ad 9.5 cm. longa, fauce ampla, 5-dentata, dentibus setiformibus, ca. 5 mm. longis; capsula globosa, puberula, regulariter dehiscenti, pendula, spinis rigidis, acuminatissimis ornata, ca. 2 cm. longa; seminibus reniformibus, lacunis luniformibus utrinque donatis.

Dichotomously branching herb at least 30 cm. tall, but surely more (the specimen at hand is incomplete); young branches strigose, becoming glabrous with age, entire plant appearing glabrous except when young; leaves alternate, ovate-lanceolate in outline, with an acute apex and an unequal base extended into a puberulent petiole, up to 4.8 cm. in length; margins irregularly lobate-dentate; leaf blades mostly incomplete in our specimen, up to about 8 cm. or more in length, one-half to two-thirds as broad, surfaces essentially glabrous except for the sparsely strigose veins; erect pedicellate flowers borne

in the axils of the branches; the strigose pedicels during anthesis about 1 cm. long becoming elongated and reflexed with age; prismatic calyx tube 5-toothed at the apex and keeled along the angles, glabrous on both sides, about 6 cm. long; the calyx teeth ovate-lanceolate, 1.7–2 cm. long and 0.5 cm. wide at the base; corolla funnel-shaped, plicate, terminating in a 5-dentate orifice, up to 9.5 cm. long; the five corolla teeth setiform, about 5 mm. long and 2 mm. wide at the base, each of them supported by three conspicuous nerves, the median one extending to the tip; exterior of the corolla tube glabrous, the interior pubescent from the base up to the point where the filaments are attached to the corolla tube, then becoming glabrous above this point; the five stamens free, epipetalous, attached to the corolla tube at approximately the same level about 3 cm. from the base of the corolla; filaments glabrous except near their attachment to the corolla, 2.8 cm. long; anthers about 6 mm. long with filamentous trichomes along the lines of dehiscence; style 7.8 cm. long; calyx circumscissile, forming a reflexed frill, up to 1.3 cm. long, which subtends the fruit; capsule globose, about 2 cm. long, regularly dehiscent by four valves, pendent on pedicels up to 2.2 cm. long; fruits covered with stiff, sharply pointed spines; surface of fruit puberulent, spines glabrous; seeds reniform, about 5 mm. long and 4 mm. broad, with lunate lacunae on the lateral faces and with a triple ridge along the convex edge which forms a cord-like margin around the seed.

MEXICO: State of Sinaloa, vicinity of Culicán, Sept. 14, 1904, T.S. Brandegee s.n. (TYPE: UC 103947).

Datura reburra is similar to *D. discolor* Bernh. in having both nodding fruit and regularly dehiscent capsules. It is, however, readily distinguishable by its distinctive seeds, its puberulent fruit with glabrous spines and its

smaller flowers. The specific epithet of *Datura reburra* refers to the bristling hairs of the capsule.

The question arises, in connection with this new species, as to the validity of the sections *Stramonium* Bernh. and *Dutra* Bernh. The *Stramonium*-section has been distinguished by erect and regularly dehiscent capsules; the *Dutra*-section by nodding and irregularly dehiscent capsules. Both *Datura reburra* and *D. discolor* are characterized by having nodding capsules that dehisce regularly by four valves. Thus, they provide intermediates between the two sections in question.

Prior to my discovery of *Datura reburra*, Fosberg had called my attention to the vague distinction between these two sections, pointing out the nonconformity of *D. discolor* to either one. This additional species would tend to support the belief that these two sections are untenable, unless we propose a new section for every second or third species. Such a procedure would be definitely absurd.

In light of the genetic and cytological work on *Datura* already completed by the late Dr. Blakeslee and by his co-workers, a more thoroughgoing study of these new species should prove to be profitable. Experimental approaches further our knowledge of plants and their relationships to a great degree. Nevertheless, much can also be learned from a study of herbarium material. In fact, such a study should logically precede experimental lines of research.

***Datura vulcanicola* Barclay sp. nov.**

Planta fruticosa, usque ad 3 m. alta; foliis ovatis vel ovato-ellipticis, apice acutis, basi in petiolum decurrentibus, utrinque puberulescentibus, margine integra vel irregulariter sinuato-dentata; floribus solitariis, plusminusve horizontaliter cernuis vel nutantibus arcuatis; calyce glabro, paulo inflato, cylindrico, 4.5–8 cm. longo,

apice inaequaliter 2-4 dentato; corolla usque ad 20 cm. longa, urceolata, apice 5-dentata, margine inter dentes breviter retusa; capsula obovata, prominenter bisulcata, irregulariter verrucosa, usque ad 12 cm. longa; semine reniformi, testa glabra; numerus chromosomicus, $2n = 24$.

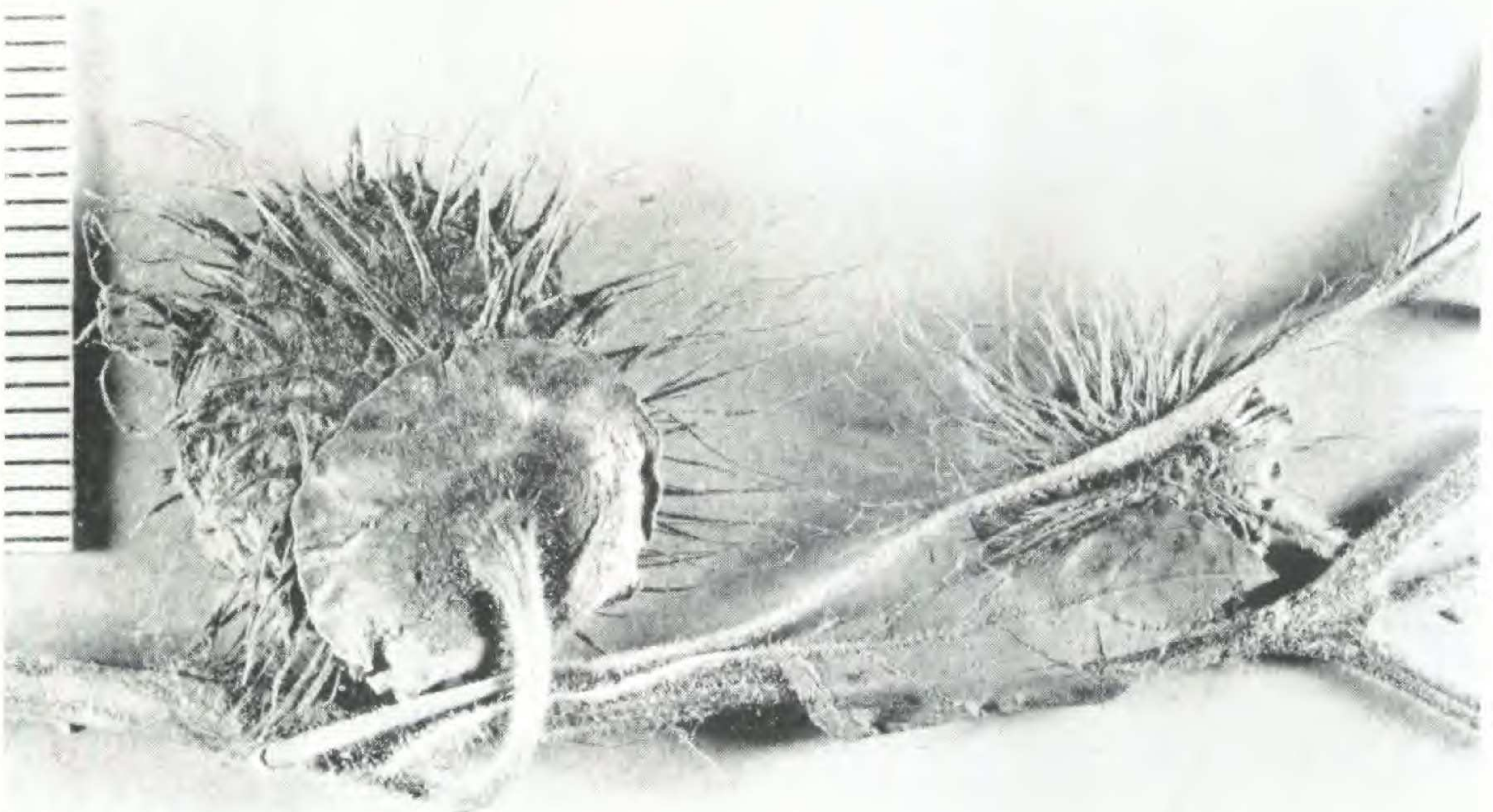
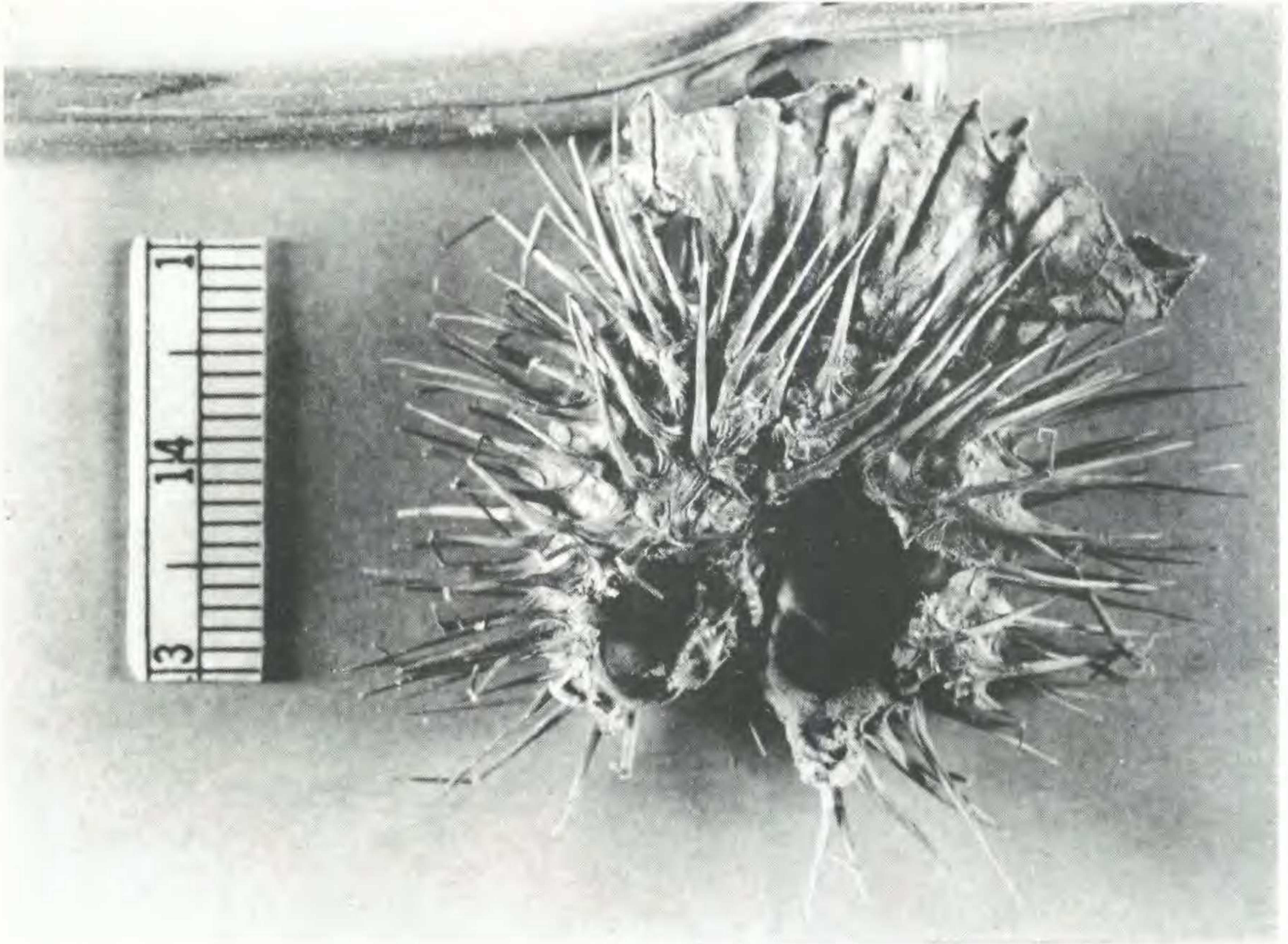
Perennial shrub or small tree reaching 3 meters or more in height; leaves alternate; blades up to 20 cm. long and up to 10 cm. broad, puberulent on both surfaces, ovate to ovate-elliptic in outline with an acute apex and a subequal base decurrent on the up-to-10 cm. long petiole; margins entire to irregularly sinuate-dentate; the larger, dentate leaves occurring on juvenile shoots with the smaller and entire ones on older branches; flowers axillary on somewhat arcuate, 1.5-2.7 cm. long pedicels; corolla tube basally green becoming light red which fades into yellow near the mouth, the veins red, interior of the tube deeply red tinged between the nerves, the upper half yellowish white, becoming deeply yellow near the mouth; calyx glabrous, somewhat inflated, cylindric, 4.5-8 cm. long, often split along one side giving a spathe-like appearance to it; calyx teeth two to four, unequal in length; corolla up to 20 cm. long, urceolate, terminating in a 5-dentate orifice, each tooth supported by three prominent nerves; the margin between the short and acuminate teeth slightly retuse; the five stamens free, epipetalous, extending to just below the mouth of the corolla, attached to the corolla tube at approximately the same level, 7-8.9 cm. from the base; filaments glabrous above, becoming villous near the point of adnation, anthers white, filaments pale green; shortly after anthesis the calyx dehisces at the base of the ovary and is shed; capsules obovate, deeply bisulcate with a secondary shallow division, up to 12 cm. or more in length, warty in appearance; seeds reniform, about 7 mm. long and 5 mm. wide, seed coat smooth on both sides, shiny, slightly

EXPLANATION OF THE ILLUSTRATION

PLATE LIII. *Upper:* Fruit of the type of *DATURA REBURRA* *Barclay* (*T. S. Brandegee*, s.n., Sept. 14, 1904). *Lower:* Fruit of the type of *DATURA KYMATOCARPA* *Barclay* (*G. B. Hinton*, No. 8173).

Photograph by CHARLES DILLS

PLATE LIII

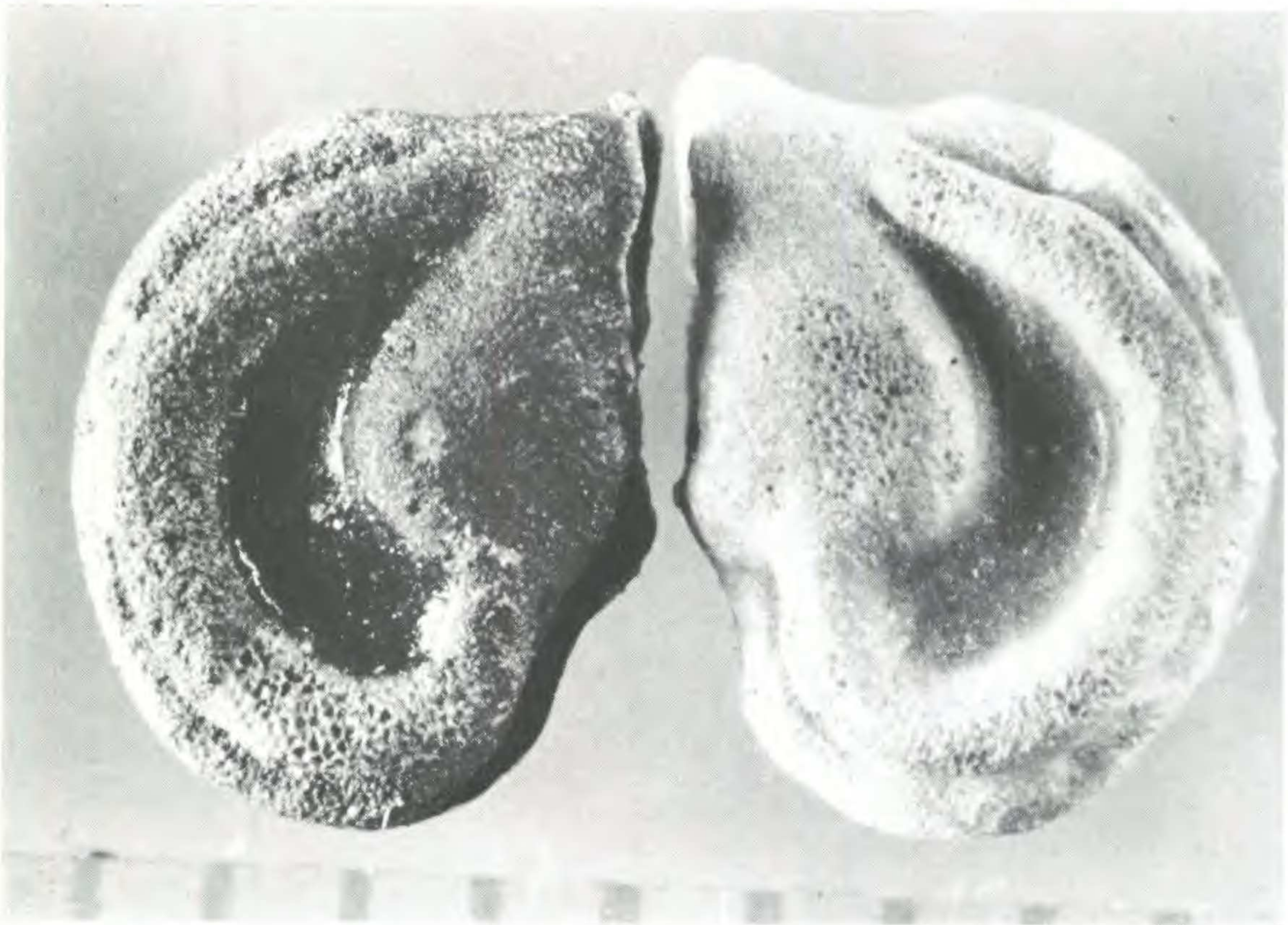
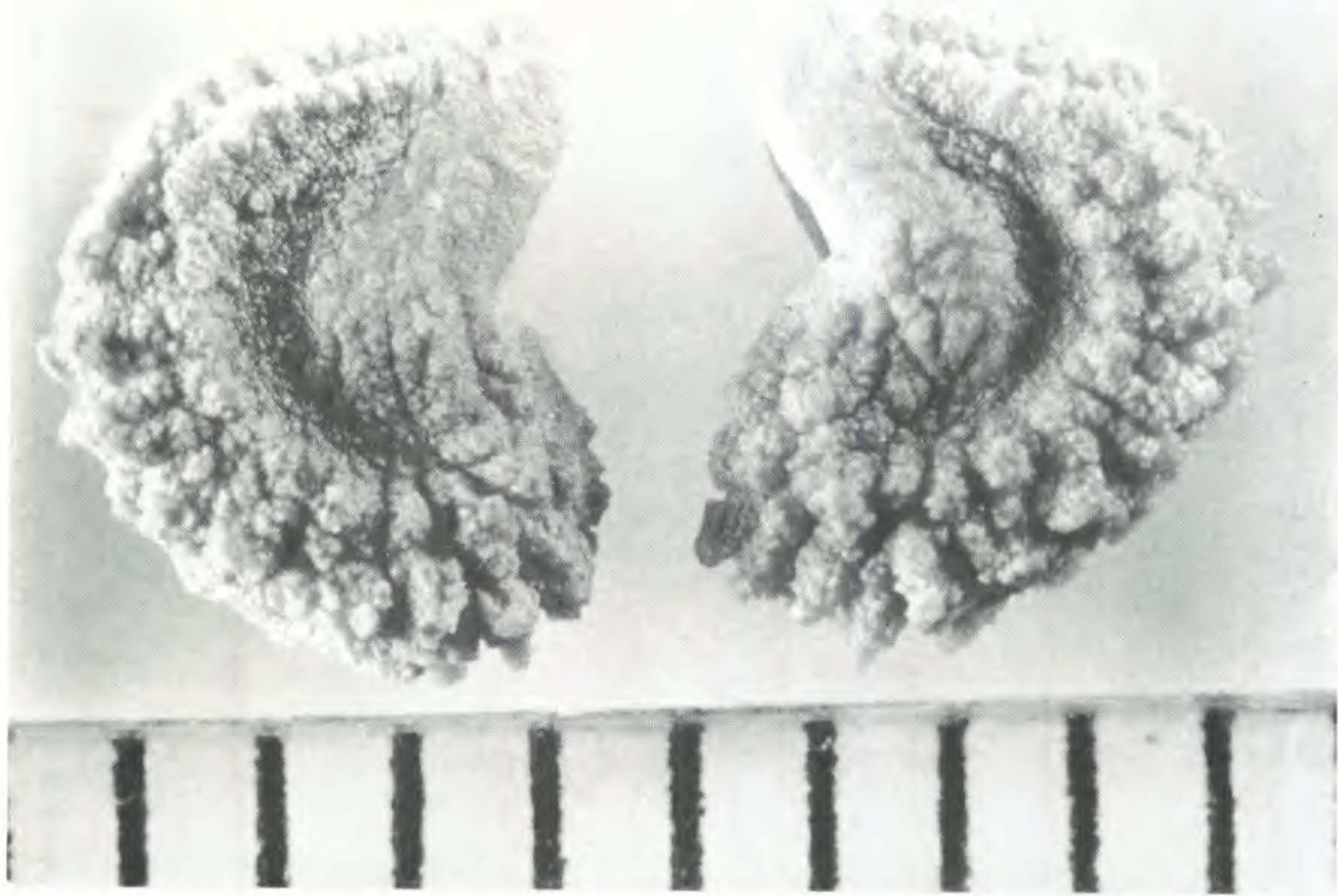


EXPLANATION OF THE ILLUSTRATION

PLATE LIV. *Upper:* Seeds of *DATURA KYMATOCARPA* *Barclay* (*Leavenworth*, No. 1615). *Lower:* Seeds of the type of *DATURA REBURRA* *Barclay* (*T. S. Brandegee*, s.n., Sept. 14, 1904).

Photograph by CHARLES DILLS

PLATE LIV

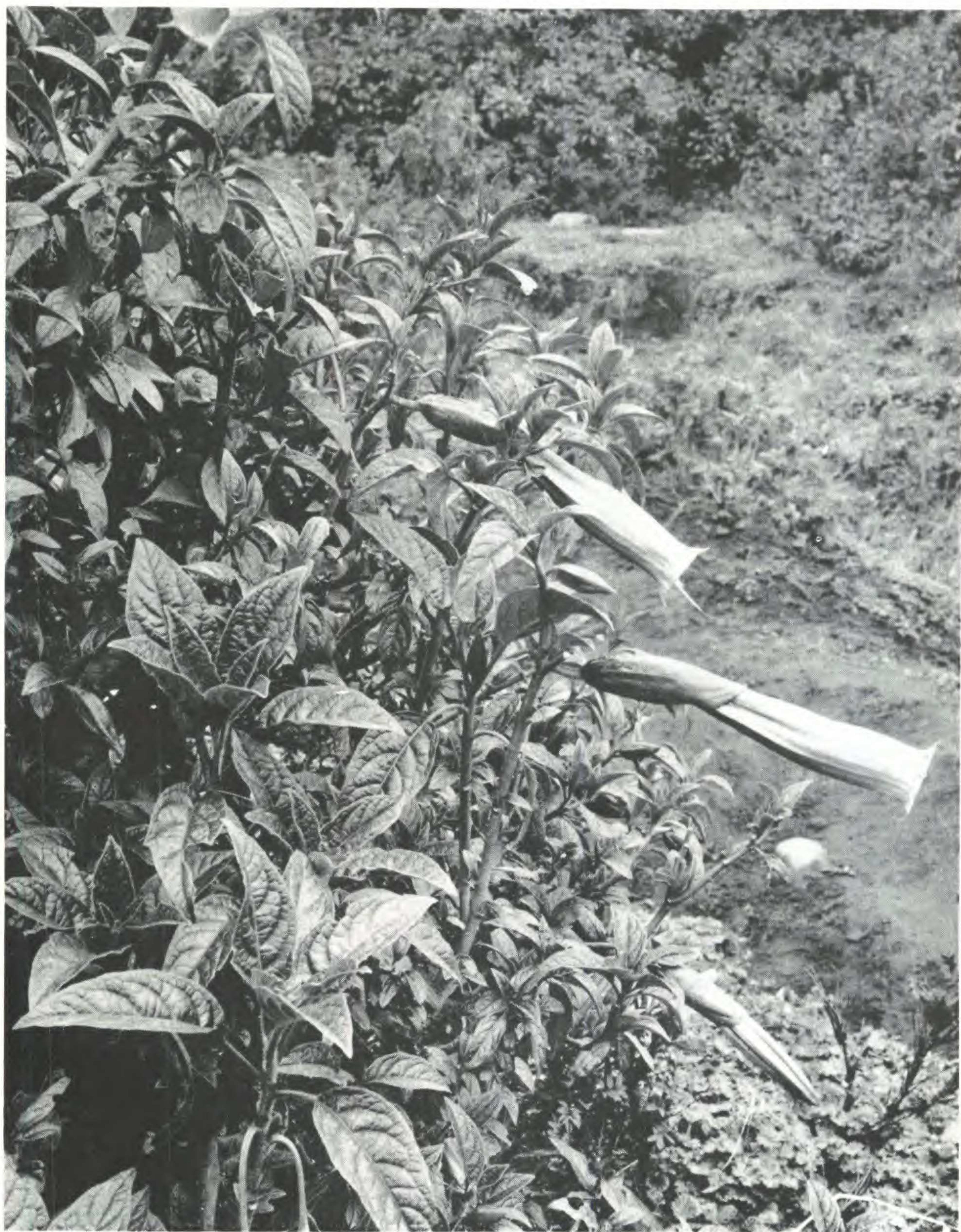


EXPLANATION OF THE ILLUSTRATION

PLATE LV. *Datura vulcanicola* *Barclay*. Photograph of the plant from which the type specimen was collected (*A. S. Barclay & R. E. Schultes No. 147*).

Photograph by RICHARD EVANS SCHULTES

PLATE LV

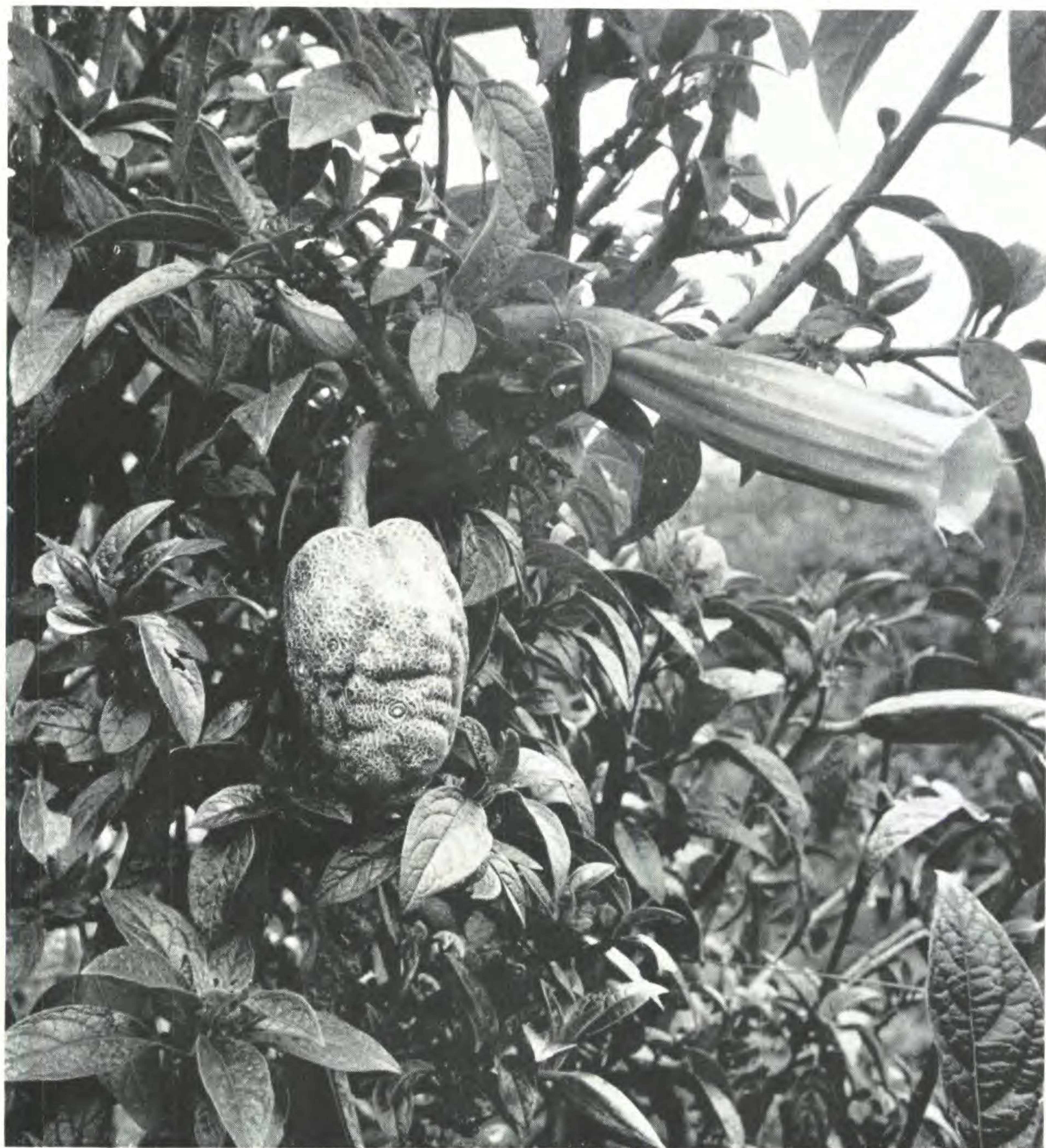


EXPLANATION OF THE ILLUSTRATION

PLATE LVI. *Datura vulcanicola* *Barclay*. Same as
Plate LV in flower and fruit.

Photograph by RICHARD EVANS SCHULTES

PLATE LVI



ridged on the convex side; chromosome number, $2n = 24$.

COLOMBIA: Dept. of Cauca, Municipality of Puracé, northern slope of the Volcán de Puracé, alt. 2700-2800 m., July 23, 1956, *A. S. Barclay & R. E. Schultes 147* (TYPE: GH).—Same locality and date, *A. S. Barclay & R. E. Schultes 149 and 177* (GH).—Between Puracé and its páramo, Chiquín, heath-brush, alt. 2700-3100 m., July 11, 1939, *E. Pérez-Arbeláez & J. Cuatrecasas 5960* (F, US, COL.).—Puracé, alt. 3300 m., Feb. 1938, *K. von Sneider 1898* (US).—Paletará to Calaguala, alt. 3000-3200 m., July 17, 1922, *F. W. Pennell 7093* (GH, NY, US).

In 1956, during my field studies of the tree *Daturas* in the Colombian Andes, I was surprised to find on the side of the famous and active Volcán de Puracé populations of what was at once distinguishable as a striking and beautiful new species of the genus. Herbarium specimens, fixed buds for cytological study, about 50 pounds of leaves for chemical analysis and living material in the form of cuttings and seeds for horticulture were gathered.

Earlier specimens which had been collected in the same general vicinity on the slopes of the volcano and which also represent the new species had been filed in our herbaria under the name *Datura sanguinea* Ruíz & Pavón. *D. vulcanicola* seems to be most closely related to *D. sanguinea* on the basis of comparative morphology.

Although *Datura sanguinea* is a highly variable species, *D. vulcanicola* may readily be distinguished from it by a number of characters, among the most prominent of which are its warty fruit and its smooth seeds. The fruit has a hard, almost woody pericarp and is attached to the branch by a stout peduncle which becomes nearly as thick as the branch supporting it. *D. sanguinea*, on the other hand, is characterized by its smooth, more fleshy fruit which is attached by an elongated, relatively unthickened peduncle and by its verruculose seeds.

The flowers of the new species are cernuous or nodding at a 30 to 45 degree angle, with a glabrous, nearly satin-

textured calyx and corolla. The light red to salmon-colored corolla tube fades into yellow near the mouth. The nerves are red, and the slightly inflated calyx tube dehisces after anthesis. In comparison, the flowers of *Datura sanguinea* are vertically pendulous, variously pubescent, and although the coloration is quite variable, the corolla tube is usually yellow becoming red towards the mouth with conspicuous greenish to yellow nerves. A much inflated calyx tube which is often persistent following anthesis forms a husk around the fruit.

Datura vulcanicola, as far as I could judge, does not reach the great height or corpulence which is commonly found in *D. sanguinea*. The chromosome number of $2n = 24$ (*A. S. Barclay & R. E. Schultes no. 147*) agrees with that of the other arborescent *Daturas* investigated.

In a communication to me, Professor Schermerhorn of the Massachusetts College of Pharmacy has related that a preliminary biochemical analysis of the leaves of this new species has shown no significant differences between the alkaloids present in *Datura vulcanicola* and in the other species of *Datura*.

Although *Datura vulcanicola* occurs in large numbers in the subpáramo heath vegetation under conditions which could be interpreted as wild, I am of the opinion that the abundance of individuals at the type locality is probably the result of human activity. My principle reason for believing this is that most of the plants were growing along what are or obviously had been foot paths or donkey trails. Furthermore, we must not overlook the fact that for centuries this agriculturally rich volcanic area has been populated by advanced Indian peoples who are known to have employed *Daturas* as narcotics in their magic and therapeutic practices. It is interesting to note in this connection, however, that *D. vulcanicola* has not been spread, at least to any appreciable extent, from this

locality by primitive man. It may yet be found on neighboring mountains, but neither the comparatively thorough explorations in this general area in the past nor my own collecting, directed almost exclusively to *Datura*, have turned it up elsewhere.

ACKNOWLEDGMENTS

I would like to acknowledge the help and encouragement of my major professor, Dr. R. C. Rollins, who made available to me the Fernald Fund of Harvard University for field work in South America. I also owe a debt of gratitude to Dr. R. E. Schultes who first suggested the genus *Datura* as a research subject and whom I had the privilege of accompanying while in South America. To Dr. Jesús M. Idrobo, Dr. Alvaro Fernandez-Pérez and the other members of the Instituto de Ciencias Naturales, Bogotá, Colombia, I wish to extend my deepest gratitude and appreciation for their kindness and help during my stay in their country.

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